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The Work and Family Role Orientations of STEM students

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DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, cited and referenced.

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Abstract

Students in the future can expect to partake in two life roles as adults: a work role and family role. This study investigated the life role salience of students studying science, technology, engineering and mathematics ($N = 191$) and examined the extent to which their gender role ideology and perceived parental work-family conflict are predictors of life role salience. Regression analysis showed that students with traditional gender role ideologies had greater family role salience and students with egalitarian gender role ideologies had greater work role salience. Further analysis showed that students' family role salience was predicted by the work-family conflict of their same-sex parent. The implications of the findings and suggestions for future research are discussed.

Key words: work role salience, life role salience, gender role ideology, maternal WTF conflict, paternal WTF conflict, STEM students.

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Chapter 1: Introduction

Background and motivation

Young adults hold perceptions about their future work and family roles, and they may expect to experience conflict between these roles (Weer, Greenhaus, Colakoglu, & Foley, 2006). The term young adults is used to describe people in their late teens and early twenties whose life directions are not yet set (Arnett, 2000). These perceptions impact their identity and career development process during this stage of their lives (Friedman & Weissbrod, 2005). Knowing how young adults perceive their future work and family roles can provide an awareness of prominent issues that emerge because of these perceptions (Campbell, Campbell, & Watkins Jr., 2015; Westring & Ryan, 2011). Therefore, the purpose of this research was to investigate the attributed importance students have towards future work and family roles; and the extent to which their parents' experiences, and gender role ideology influence their perceptions of future work and family role. The students used in this study were students who were studying degrees that were related to science, technology, engineering and maths. These fields are also commonly known as STEM fields.

The work-family interface is an important aspect of an individual's life as they devote a large amount of time and energy in the roles encompassed in these domains (Cinamon, 2006). Young adults spend the decade after university launching demanding careers, establishing long-term relationships and developing dual-earner families (Barnett & Hyde, 2001; Cinamon, 2006). Little is known about how these work family issues affect the career development process of young adults (Westring & Ryan, 2011) and about the work and family expectations of South African students. By understanding what the values and expectations of young people are, one can predict what lies ahead regarding their future work and family life (Bu & McKeen, 2000).

Deloitte (2016) conducted a world-wide survey amongst its millennial employees. The aim of their research was to identify the factors that would attract the next generation of employees to potential employers. The survey sought to elicit from millennials the factors which also increased their loyalty to the organisation. Millennials who took part in the survey were from both emerging as well as developed markets. Emerging markets consisted of countries such as South Africa and South Korea, whilst the developed markets consisted of countries such as Canada and Australia.

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The findings of the survey revealed that millennials seek more traditional personal goals which include: achieving a good work/life balance, wanting to own their own homes, and striving for financial security that allows them to save enough money (Deloitte, 2016). Millennials, according to the survey, were most likely to select an organisation that promoted a good work/life balance. This was followed by opportunities to progress/be leaders and lastly flexibility in working arrangements (Deloitte, 2016).

Similar findings were obtained by the Boston College Centre for Work and Family in a study they conducted in 2011 amongst 1100 millennials between the ages of 18-35. The aim of the research was to assess the factors that impacted the career identity of the group. Young adults reported work-life balance as the most important aspect of their career success in comparison to job satisfaction or job remuneration.

Young adults rated life outside of work over their career as very important to their identities. This was in comparison to: salary or salary growth rate, achievement of personal goals, work achievements and the development of new skills. Finding optimal work-life integration, opportunities for career advancement were another way of measuring career success (Boston College Centre for Work & Family, 2015). These findings were the same for both men and women.

The studies by Deloitte (2016) and Boston College Centre for Work and Family (2015) highlight the importance work and family plays in the career progression of young adults. A study by Brown, Morin, Parker, Patten, & Taylor, 2014 revealed that millennials were likely to get married later, have children later and were less likely to own a home by the age of 30 in comparison to the previous generation. This could in part be because of the changing nature of society from traditional gender role ideologies to more egalitarian gender role ideologies. A change towards egalitarian gender role ideologies gives both gender groups opportunities to have careers. Whereas previously, only men had access to career opportunities.

Women traditionally were known to be the caretakers of the household while men worked and were considered the breadwinners of the family. Now it is socially acceptable for men to take on more responsibility as fathers and help to raise their children (Barnett, Gareis, James, & Steele, 2003). South African legislation such as

the Employment Equity Act No 55 of 1998 and affirmative action have promoted not only the participation of women in the workplace, but their career progression as well.

Even though legislation provides women access to career opportunities, their progress in the field of STEM is hindered. Kleist (2015) reported that women were underrepresented in management positions and that they only constituted 10% of the STEM workforce and they tended to leave the field after the birth of their first child.

Apart from gender role ideology, their parents' experiences of their work and family role could also influence the perceptions STEM students have towards their future work and family roles. Particularly the conflict they would have witnessed them experiencing while they were children. Based on social learning theory, children are likely to model their perceptions of work and family roles after observing their parents' experiences of them. Parental work-to-family conflict has the potential to provide greater understanding as to whether or not STEM students do indeed model their own perceptions of work and family roles based on the conflict that their parents experienced in fulfilling their own work and family roles.

Aims of the Research

This study provided understanding of the attributed importance of work and family roles for STEM students. It also provided information regarding the extent to which the importance of these roles was influenced by their gender role ideology and their parent's experiences of work and family role conflict.

The information from this study would benefit career counsellors by providing them with information for interventions to assist young people with the planning of their future work and family roles (Colye, Fulcher, Schroeder & Van Leer, 2015). Organisations who want to attract STEM graduates would also benefit from this study as they could, use the information yielded to develop work and family policies that are conducive to the work-family balance millennials desire.

Lastly the research provided information on the attributed importance of work and family roles to young adults in the South African context.

Research Questions

Do STEM students have a greater attributed importance to their work or family role?

To what extent does gender role ideology relate to the attributed importance of STEM students work or family role?

To what extent does parental work-family conflict relate to the attributed importance of STEM students' work or family role?

Structure of the dissertation

In the above section; Chapter 1 consisted of an introduction of the present study and its aims. Chapter 2 consists of a review of literature relevant to students' work and family role importance, gender role ideology and parental work-family conflict. The chapter then concludes with the propositions of this study. Chapter 3 contains the research design and methodology used to collect data, sample related information and the techniques used in the process of data analysis. Chapter 4 describes the analysis of the data collected and the results obtained from the data analysis are presented. Chapter 5 concludes the dissertation. This chapter consists of a discussion of the findings. The limitations of this study and the recommendations for future research are discussed.

Chapter 2: Literature review

This chapter begins with an explanation of the methods used to obtain literature for this study and is followed by the theoretical framework used to understand the work and family life roles of individuals. A review of the past literature is then presented. This is based on work and family role research, gender role ideology research and parental work-family conflict; all relating to young adults. The research propositions of this study then conclude the literature review.

Literature Search Procedure

In searching for literature, the following databases were used: EBSCOhost, Emerald, Science Direct, JSTOR, PsycInfo and SA e-publications. Search terms that were used: included “work role”, “work-family balance”, “family role”, “college students”, “perceptions”, and “attitudes”. Searches were also refined using the thesaurus function or the advanced search function in the databases. Articles were then refined to include literature from between the year 2000 to the year 2016. The search was further refined to include articles that were from peer-reviewed journals.

Boolean operators were used in-between terms to ensure the most optimal search resulted in relevant literature. There is a large body of literature on the work-family interface, and most of it is focused on work-family conflict and work-life balance.

Obtaining information on the topic of the work-family interface with regards to student’s expectations also proved to be challenging. The literature obtained focused on the work-family interface among employees and in the organisational context.

Theoretical Framework

Young adults between the ages of 18-25 years of age are characterised as being in an emerging adulthood stage of their lives (Arnett, 2000). A stage which consists of identity exploration and change as they make decisions that are likely to influence their future roles in adulthood (Friedman & Weissbrod, 2005). Two of the future roles young people can expect to find themselves in would be their work role and their family role. The expectations that individuals hold affects their performance in the role as well as their satisfaction of the role (Friedman & Weissbrod, 2005). The roles that individuals hold can be influenced by several factors that are societal or cultural (Spain & Bianchi, 1996; Bu & McKeen, 2000).

Using role theory and the Life-Career rainbow as a theoretical framework, the roles of young adults (as well as their formation) can be better understood (Wiley, 1991). The link between self-identity, role salience and role choice has also been confirmed by previous studies such as (Wiley, 1991).

Role theory

Individuals will find themselves in multiple roles during their lives whether it's being a student, a mother or a teacher. These which may seem like everyday activities are in fact socially defined and come with a set of expectations which define the norms and behaviours that occur within these roles (Stryker, 1968). The roles individuals possess impact their identity, as one's social life forms a part of their identity. As students find themselves in multiple roles during their early years of adulthood, consequently this affects their identity (Reitzes & Mutran, 1994; Stryker & Burke, 2000).

The relationships that individuals form become a network of influences on the behaviour they display while in these roles. However, role expectations are not only external but internal as well. The individual themselves also possesses internal expectations that drive their behaviour within their roles (Stryker & Burke, 2000). Another driver of behaviour is the extent to which the individual is committed to their role. According to Mead (1934), commitment to a role exists in two forms: commitment that is given to a role due to the number of relationships associated with that role and, the extent to which the individual values the people they are in relation with to their role. It is then possible for individuals to value their roles per a hierarchy, with the most important role receiving the most commitment and better performance of the individual.

Based on role theory, the roles students have in their work and life spheres would impact greatly on their identity. And behaviour which they display while performing these roles would then be an indication of their commitment to their role as well as the expectations of their relationships and their own internalized expectations. However, the roles that students would have could also impact their career development. The life-career rainbow developed by Donald Super as a theory for understanding the impact individuals' roles have on their career development will be discussed further on.

Life-career rainbow

A career is a combination of a sequence of roles that a person plays throughout the course of their life (Super, 1980). Super likens our lives to a theatre where we all perform roles. During different life stages one will take on a different role, or even multiple roles. There are nine roles which Super identified that individuals can embody during their lifetime, these roles are: child, student, leisurite, citizen, worker, spouse, homemaker, parent, and pensioner (Super, 1980). Situational and personal factors influence the role in which individuals find themselves.

The theatres where these roles are performed were named: the home, the school, the community and the workplace (Super, 1980). The classification of roles and theatres are not limited to those defined by Super, and the time that an individual can play in a role in entering, duration and exiting differs from one individual to the next. Individuals can also have multiple theatres where to perform these roles for example, a worker could perform this role in the workplace and in the home, should they work from home (Super, 1980). The roles and theatres are interactive in nature and impact the identity of the individual as they seek self-actualization. The participation of individuals in multiple roles or theatres could result in role conflict that impacts their performance.

When an individual considers their role important and values it, their performance in that role consequently improves. Super (1980) attributes the importance of a role to be represented by the knowledge, participation and commitment an individual has in that role. The life-rainbow developed as a career development tool allows one to understand the way the roles individuals have influence their careers. And how these roles are changing and developing constantly throughout the development of the lifespan. These roles are also constantly changing the individual's identity.

Super's life-rainbow consists of five life and career development stages. The five stages are namely: Growth (age 0-14), exploration (age 15-24), establishment (age 25-44), maintenance (age 45-64) and decline (age 65+). Each life stage will require the individual to perform different developmental tasks, which will in turn contribute to the vocational maturity of the individual (CareersNZ, 2015). As individuals transition through different life stages such as adolescence, and different stages of adulthood their roles change, this impacts on their career development. Their identity and

selfconcept is also affected as it is continually developed as the individual adopts new roles and new theatres during their lifespan (Super, 1980).

Life Role Salience

Work and family demands form an important part of individuals' lives. As employees navigate the professional aspects of their lives they are also confronted with meeting demands in their family life. Whether it be as a husband or wife or as a parent (Weer, Greenhaus, Colakoglu, & Foley, 2006). With women being an active part of the workforce, the composition of marriages, households and the labour force itself has also changed. The responsibility of managing competing roles is now a common experience for both men and women (Amatea et al.,1986).

Amatea et al. (1986) developed the life role salience scale as there was a need to assess the expectations individuals held with regards to their future work and family roles. These expectations were defined by Amatea et al. (1986) as being a combination of internalized beliefs and attitudes. These were then driven by: the relevance of the role to the individual, the performance standards of the role, and the extent to which personal resources such as time and energy are to be committed to this role. As individuals participate in a number of roles, this could result in them experiencing stress and conflict. Studies such as Cinamon (2010) have found that young adults do expect to experience conflict between their future work and family life.

Table 1 is a summary of all the literature obtained that has investigated the future work and family role salience of students. The life role salience of students in this study consisted of their future work role and family roles. Work values refer to the general expectations of an individual with regards to their work, as well as the components of the job that are important to the individual gaining satisfaction from that job (Dawis, 2001; Duffy and Sedlacek, 2007; Elizur, 1984). While the family values include the components of the parental role and the home maker role. These roles are characterized by activities such as child-rearing and being a disciplinarian.

Existing literature has also investigated the differences that men and women have regarding their future work and family roles. Traditionally women were the caretakers and homemakers, while men had more prominent career roles as professionals (Gartzia & Fetterolf, 2016; Mosher & Danoff-Burg, 2007). The impact of gender

equality has seen a greater balance in the role participation of both men and women over time. Research on the expectations of young men and women about their future work and family roles has been inconsistent. Some studies have found significant gender based differences in role salience (Wright Kassner, 1981), while others have not (Bleske-Rechek et al., 2011; Gartzia & Fetterolf, 2016).

Life role salience research in South Africa

Life role salience research in South Africa has been conducted amongst working professionals. Bosch, de Bruin, Kgaladi, & de Bruin (2012) conducted a life role salience study amongst African dual-career couples. The study reported findings indicating that Black African women had an equal level of role salience towards their career as their male counterparts. Gender differences across the work and family roles were also not present in the study. Similarly, in a study conducted by Naidoo and Jano (2002) investigating the role salience of women managers, women participated greatly in their work role yet they had a greater commitment to and value expectation from their family role. Value expectation refers to the “attitudes toward the roles indicating the degree to which major life satisfactions or values are expected to be found in respective roles” (Jano and Naidoo, 2002, p.70). The results of the study also indicated that the women managers perceived their roles as complementing one another and not in conflicting interactions to one another. Based on the above information the following positions were formulated for this study:

As previously mentioned, a small amount of literature exists in the work-family interface that looks at the life role salience of young adults. Even fewer researchers have examined the life role salience of young adults in the South African context. A study by (De Jager, Watson & Stead, 1995) on the work and study role salience of black and white South African students revealed that culture had a significant effect on their work role salience while gender had no significant on the work role salience of these students. The contribution of this present study will yield a better understanding of the future work and family values and role salience of students in STEM related fields. The following section will be a discussion of some of the factors that could influence these values and expectations. The factors identified for this study are: gender role ideology and parental work-family conflict.

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Table 1

Summary of life-role salience research conducted amongst university students

Authors	Sample	Variables	Results
Gartzia & Fetterolf, (2016)	Undergraduate students	-Gender -Employment expectations -Division of childcare and household labour	<ul style="list-style-type: none"> - No significant differences between genders. - Female participants perceived their career goals as more attainable than male participants -Female students perceived no employment in comparison to full-time employment to be more facilitative for family goals -Female participants anticipated longer employment hours for their partners than the male participants did - Greater anticipated employment caused participants to expect longer working hours and less domestic labour for themselves, - Both males and females expected more housework and childcare duties from their partners. -Participants expected fewer employment hours and a smaller salary than their husbands as well as more housework and childcare. -When employed full time the participants anticipated their husbands completing more of the housework and childcare and them doing less themselves.
Fetterolf & Eagly, (2011)	Undergraduate women	-Wages and domestic labour - Attainment of life goals	

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Bleske-Rechek, Feurstenberg, Harris, & Ryan (2011)	University students: juniors and seniors	-Gender -Work and family plans, -Educational aspirations	<ul style="list-style-type: none"> - No gender differences between junior students with regards to their perceived working hours once employed. -Significant gender differences between senior students in combining work and family. - No significant differences between junior and senior students in the work and family plans. - Once having had young children at home, women planned to work fewer hours than men did. - Men foresaw working more hours than their partner when raising young children.
Cinamon, Most, & Michael (2008)	Unmarried young adults with and without hearing loss	-Life role salience -Levels of hearing ability -Parental role salience -Intentions to parent -Expectations of parenting role	<ul style="list-style-type: none"> - Deaf participants had a greater commitment to work in comparison to the other hearing groups. -Across all three groups the family roles were more important than the work role - No gender differences in the perceptions of the parenting role - Both expectations and role salience were positively correlated with parenting intentions
Yaremko & Lawson, (2007)	Childless undergraduates	Gender	<ul style="list-style-type: none"> - Women placed more importance on the parenting role than men,

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Mosher & Danoff-Burg (2007)	Undergraduates	<ul style="list-style-type: none"> - Personality traits (genderlinked) - Life goals (social and occupational outcomes) - Gender 	<ul style="list-style-type: none"> - Men were more willing than women to sacrifice achievements for a romantic relationship, - Agency was positively associated with the importance of the achievement of goals - There was a positive association between agency and the importance of having children - Men displayed a greater agency personality trait than women - Women displayed a more communion personality trait than men - No gender differences across life goals - Intrinsic interest, high salary, contributions were the contributions to students most important work values - Students from median income levels adopted intrinsic values towards work commitment while those from lower income backgrounds attributed extrinsic values to work commitment
Duffy & Sedlacek, (2007)	Undergraduates	<ul style="list-style-type: none"> - Work values - Parental income - Educational aspirations - life role salience - work and family commitment - gender - age and year in school 	<ul style="list-style-type: none"> - no significant differences between gender towards either work or family commitment
Friedman & Weisbrodd (2005)	College juniors and seniors		

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			<ul style="list-style-type: none"> - Female students expected greater difficulty in balancing work and family than males - Chinese students attributed more importance to their occupational roles more than parental and homecare roles, - Chinese students were more committed to the occupational role and less committed to the parental and marital roles than Canadian students. - Both Canadian and Chinese students were equally committed to the homecare role. - no significant differences between gender towards either work or family commitment
Bu & McKeen (2000)	Undergraduates	<ul style="list-style-type: none"> -life role salience, nationality, gender - work-family commitment, Feminism 	
Hartung & Rogers, (2000)	Undergraduates		<ul style="list-style-type: none"> -Culture was a significant indicator of work role salience -Gender was not a significant predictor of work role salience
Watson, Stead & De Jager (1995)	Undergraduates	<ul style="list-style-type: none"> -Gender - Culture - Work role salience - Commitment to work - Social class 	
Darrell (1994)	Undergraduates	<ul style="list-style-type: none"> - Gender - Ethnicity - Gender, desired job involvement, desired family involvement. 	<ul style="list-style-type: none"> - Women were significantly more committed to work than men - No significant differences between ethnic groups towards commitment to work - Gender correlated significantly to desired family task involvement, family social involvement and desired job task involvement.
Wright Kassner (1981)	Undergraduates		

Gender Role Ideology and Life Role Salience

Individuals have different views about the roles of women and men at work and at home (Judge & Livingston, 2008). These views would be associated with the behavioural norms of males and females (Eagly & Wood, 1988). Gender role ideology views can either be traditional or egalitarian. Individuals with traditional views of gender roles would believe work roles to be more important to men and family roles to be more important to women, while individuals with egalitarian views would believe in equal role importance of both these roles to men and women (Barnett & Hyde, 2001). The way students expect to experience their future work and family roles would be influenced by their attitudes towards the roles of men and women in both arenas (Loo & Thorpe, 2005).

These views that young adults have with regards to gender roles are formed in a few ways. Gender role ideology perceptions of young adults could be a result of culture, society, ethnicity and vicariously learning how their own parents experienced their work and household participation (Brown, 2002; Fulcher, Dinella, & Weisgram, 2015). Table 2 is a summary of the research that has investigated the effects of gender role ideology and studies on the future work and family expectations of students. The research summary in Table 2 shows that gender role ideology views affect the way students view their future work lives as well as their family lives. Gender role ideology also affects the way students anticipate the division of future work and family responsibilities (Askari et al., 2010; Gere & Helwig, 2012; Wright Kassner, 1981). Therefore, the following are propositions for this study:

Proposition 1a: Traditional gender role ideology is related to family role salience among STEM students.

Proposition 1b: Egalitarian gender role ideology is related to work role salience among STEM students.

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Authors	Sample	Variables	Results
Gere & Helwig (2012)	Undergraduate students	-gender roles reasoning in the family context - Gender - Ethnicity	- gender differences in gender role reasoning - men held more traditional attitudes regarding family roles than women - gender differences in expected household chore participation - gender differences in expected child care chores participation - gender differences in gender roles; women anticipated an egalitarian
Askari et al (2010)	Undergraduate students	-liberal feminist attitude and ideology, essential characteristics of spouse -expectations for marriage and children - expectations for time at work and housework - desire for self/spouse to stay at home	- division of family responsibilities while men anticipated a traditional - division of family responsibilities - significant gender differences towards a spouse staying at home - significant gender differences towards gender role attitudes
Kaufman (2005)	Undergraduate students	- gender role attitudes	- gender role attitudes were a predictor of men's working hours and women's marriage expectations
Loo & Thorpe (2005)	Undergraduate students	-work and life values - attitudes towards women's roles in society	- attitudes towards women's roles in society were correlated to work and life values

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Livingston, Burley & Springer (1996)	University students	- Gender, sex roles, life role salience and anticipated work- family conflict	<ul style="list-style-type: none"> - women experienced lower levels of AWFC in comparison to men - marital role commitment correlates significantly with AWFC - significant positive correlation between gender and femininity - significant negative correlation between gender and masculinity,
Wright Kassner (1982)	Undergraduate students	-desired family involvement, desired job involvement, traditional or egalitarian marriage	<ul style="list-style-type: none"> - gender differences for desired family involvement - males wanting high family social involvement preferred traditional marriages - males who wanted low family social involvement preferred egalitarian marriages. - Females who wanted high family social involvement preferred egalitarian marriages, while females who wanted low family social involvement preferred traditional marriages. - Males view traditional marriages as facilitating their careers, women see them as hindrances to their careers.

Parental work-family conflict and, work and family role salience

Work-family conflict (WFC) refers to “a form of inter-role conflict in which role pressures from the work and family domain are incompatible in some respect” (Greenhaus & Beutell, 1985, p. 76). Work-family conflict is bi-directional in nature in that it could be the work role interfering the family role (work-to-family conflict) or the family role interfering with the work role (family-to-work conflict). However, for this study only the work-to-family conflict will be assessed as the participants in this study would only have been witness to their parent’s family roles and not their work roles during their childhood.

Social cognitive theory is used to describe the way boys and girls develop ideas about their future work and family roles. According to this theory, girls and boys model their future work and family roles through modelling, enactive experience and direct instruction from their parents own family roles (Fulcher et al., 2015). Similarly, social cognitive theory, social learning theory describes behaviour as the result of the influence of learning by example (Bandura, 1971). Loo and Thorpe (2005) states that although life experience and educational opportunities, values and attitudes are formed within the family unit, young adults may relate their own expectations of work–family conflict (WFC) to those of their parents (Barnett et al., 2003). Therefore, one can say that the perceptions which young adults have about their future work and family roles could be influenced by the way they perceive their parents to have experienced balancing work and family. Whether or not they have had positive or negative experiences.

According to social learning theory the experiences of young adult women and men would be modelled after the parent of the same sex. Children choose their same sex parent to model their experiences after as this gives them a greater ability to their own capabilities (Bandura, 1971). The experiences of a mother’s work-to-family conflict should influence the perceptions of the daughter more than the son of their future work and family. A study by Wright Kassner (1981) reported findings of young adults’ gender correlated with their desired job and family involvement. The study also reported that the desired job and family involvement of the women correlated significantly with that of their mothers, and the same results occurred with the men. Similarly, Basuil & Casper (2012) reported findings of the perceptions of their parents WFC was positively

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correlated to their work and family role planning. Therefore, the following are propositions for this study:

Proposition 2a: Maternal work-to-family conflict is positively related to work role salience

Proposition 2b: Female student's family role salience is predicted by maternal work-family conflict

Proposition 2c: Male student's family role salience is predicted by paternal work-family conflict.

Final Notes

The literature provided an overview of previous research that has been conducted regarding the perceptions young adults have of their future work and family roles. It is evident that there are no gender differences regarding the importance of future work and family roles. However, it is evident that the gender role ideology of young adults affects the attributed importance they expect to assign to these roles. It was also evident that the perceptions young adults had of their parents work-family conflict experience affects their own attributed importance to their future work and family role.

Chapter 3: Method

The aim of this research was to examine the extent to which gender role ideology and parental work-family conflict predict the work and family life role salience of students in STEM related career fields. This chapter details the methods used to investigate the above in five sections: research design, data collection procedures, participants, the measures and the statistical analysis.

Research Design

A descriptive cross sectional research design was chosen for this study. Cross sectional designs though are limiting because the information obtained from them cannot be used to make inferences about causality in variable relationships (Welman, Kruger, & Mitchell, 2005). A cross sectional research approach in the form of self-administered questionnaires was used to obtain the necessary information about the relevant variables (at a specific time) from the sample units. The data obtained from this sample was quantitative and it was conducive to the statistical procedures needed to test the multiple propositions of this study.

Sampling Procedure

Convenience sampling was used as a sampling procedure for this study. The population of this study were all final year and postgraduate students in South Africa, but due to proximity and accessibility constraints the sample was reduced to students in their final and postgraduate studies at the University of Cape Town. This sample was further reduced to include only students in the science, technology, engineering and mathematics related career fields. Students in their final and postgraduate years of studying were targeted as they would be closer to entering the job markets and would have a better sense of their future work and family roles.

Participants

There were 331 responses to the questionnaire. The individual responses were screened and responses with more than 25% incomplete information were deleted. 19 respondents were unsure about their marital status and 1 individual did not disclose their marital status. Furthermore, 20 of the respondents either were married or had children and since this study looked at the future of work and family roles, the responses of these respondents were deleted. The final sample comprised of 191 unmarried and childless students. Of these 191 students: 61 were male, 106 were

female and 24 respondents did not disclose their gender. The ages of the respondents ranged from 18-37 ($M = 23.14$, $SD = 3.08$, $N = 170$). Most respondents were White (35%) followed by: Black (33%), coloured (7%) and 19 % of respondents chose not to disclose their race. Table 3 is a summary of the student's year of studies and their STEM related fields. Most of the respondents were in their final year and the majority of students were studying Engineering and Constructed related degrees.

Table 3

The demographics of the sample

Demographic	Category	Percentage	Frequency
Gender	Male	32	61
	Female	55	106
Race	White	35	67
	Black	33	63
	Coloured	7	13
Year of Study	Final year	43	82
	Honours	17	33
	Masters	19	36
	PhD	6	11
	Other Postgraduate qualification	2	4
Missing data		13	25
Degree	Engineering and Construction related	42	81
	Maths and Statistics related	9	18
	Science related	37	71
	Computer and Technology related	5	9
Missing data		6	12

Procedure

To conduct this study, ethics approval was sought from the Ethics Research Committee in the Faculty of Commerce at the University of Cape Town. Further approval was sought from the Director of Students affairs to access the students of the university. A convenience sampling technique was applied and the sample was chosen based on accessibility and student's willingness to participate.

The online questionnaire was developed using Qualtrics and was distributed via email to all students' email addresses. The email was distributed to all the students of the university of Cape Town by the research administrator and it is then not possible to know specifically how many were specifically students in STEM related fields received the email, to compare them to the response rate of the students. An attempt to obtain the number of students in these courses was not successful. The email contained a link to the questionnaire that students could complete. The email also contained details on the purpose of the study and the way the anonymity of students was guaranteed. To increase student participation an incentive was included in the form of a R500 cash reward. The winner of the reward was chosen randomly out of a box with participant's details. To ensure that the respondents' details and their responses were not linked, at the end of the questionnaire, respondents were provided with the details of an email address they could forward their details too should they have wished to be entered into the lucky draw. This ensured that the anonymity of the participants was guaranteed and their responses confidential.

Measures

Life role salience

Life role salience was assessed using an adapted version of the *Life Role Salience Scale* developed by Amatea et al. (1986). The survey administered to students was a 16-item measure that had five sub measures of life role salience namely: Occupational role reward value, occupational role commitment, parental role commitment, homecare role commitment. An example of an item for the occupational role value sub scale was: "I expect my job to give me more real satisfaction than anything else I do". Amatea et al. reported a coefficient alpha of .86 for this subscale. An example of an item for the occupational role commitment scale was: "I want to work, but I do not want

to have a demanding career.” Amatea et al. reported a coefficient alpha of .81 for this subscale. An example of an item for the parental role commitment subscale was: “Becoming involved in the day-to-day details of rearing children involves costs in other areas of my life which I am unwilling to make.” Amatea et al. reported a coefficient alpha of .80 for this subscale. An example of an item for the homecare role commitment scale was: “I expect to leave most of the day-to-day details of running a home to someone else.” Amatea et al. reported a coefficient alpha of .79 for this subscale. The response scale was a Likert type scale with values 1-5, 1 meaning ‘strongly disagree’ and 5 meaning ‘strongly agree’.

Parental work-family conflict

An adaptation of the 10-item scale developed by Netemeyer, Boles, and McMurrian (1996) was used to measure perceived work-family conflict. The scale is valid for measuring the bi-directionality of work-family conflict (work interference with family and family interference with work). An example of an item is ‘The demands of my parent/guardian’s work interfered with their home and family life’. The response scale is a Likert type scale with values 1-5, 1 = strongly disagree and 5 = strongly agree. The authors reported Cronbach alpha of .82 for WFC and .72 for FWC.

Gender Role Ideology

A 5-item scale developed by Judge and Livingston (2008) was used to measure gender role ideology. The scale assesses the degree to which individuals endorse traditional versus egalitarian views about the role of women in the workforce and the balance of gender roles at work and home (Judge & Livingston, 2008). The authors reported a Cronbach alpha of .89. An example of an item is ‘A women’s place is in the home, not the office or shop’. The original response scale is a Likert type scale with points 1-4, 1 meaning ‘strongly disagree’ and 4 ‘strongly agree’ and was adapted to a 5-point scale to allow participants to have a neutral response (Maree, 2013, p. 167).

Two items measuring student’s expectations of balancing future *work-family demands* were included. These items were: *Recently I have – been concerned about the workfamily competing demands I may experience in the future* and *Recently I have – lowered my career aspirations to accommodate family demands*. These were single

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item responses. The items were included to control for the influence anticipated workfamily conflict or lowered career aspirations might have on the student's expectations about their future work and family roles.

Two items measuring *student's perceptions about their parent's homemaker roles* were included. These items were: *Growing up most of the child-rearing duties were done by my mother/father/guardian* and *Growing up most of the homemaker was my mother/father/guardian*. These were single item responses. The items were included to control for the influence their parent's experiences might have on student's own perceptions of their future work and family roles.

Demographic variables

Demographic variables were also included as single item responses in the study. These variables are useful to gain information about the characteristics of the sample. The demographic variables selected for this study include the respondent's: age, gender (coded as 1 = Male, 2 = Female and 3 = Prefer not to answer), race, marital status, general socio-economic status during childhood, year of study, registered degree and intended age of having first child.

Statistical analysis

Prior to the analysis process, data was cleaned and coded. IBM SPSS23 (Statistical Package for the Social Sciences) was used as the statistical tool on which all the data analysis was conducted. Using Maree (2013) and Pallant (2005) as a guide the statistical used in this study were: factor analysis, reliability analysis, regression analysis, correlation coefficient analysis and descriptive statistics. Factor analysis was used to examine the dimensionality of the various instruments. Reliability analysis was used to assess the internal consistency of items of the various scales by interpreting their Cronbach's alpha coefficient. Descriptive statistics were used to summarise the data collected. Correlation coefficient analysis was used to examine the relationship between variables. Regression analysis was used to test propositions.

Chapter 4: Results

Initial analyses

To test the dimensionality of the scales an exploratory factor analysis was conducted. Exploratory factor analysis (EFA) is used to gather information on the interrelationships among variables (Pallant, 2005). The varimax normalized rotation was used to sort the factors into independent groups. Principal axis factoring was used in determining dimensionality and the exclusion of weak items. Items were considered suitable for factorability when they passed Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy (Pallant, 2005). Bartlett's test of sphericity should be statistically significant at $p < .05$ and the KMO values should be $.60$ (Pallant, 2005). Items with factor loadings less than $.30$ were excluded from further analysis as there would be little correlation between the factor and the variable under investigation (Pallant, 2005).

After the EFA was run, reliability analyses were run to assess the internal consistency of the scales. This was done by interpreting the Cronbach's alpha (α) of the scales. Cronbach alphas greater than $.70$ are regarded as acceptable whilst Cronbach alphas of lower than $.60$ are regarded as unacceptable (Maree, 2013, p216). There should be a high degree of internal consistency between items as they are supposed to measure a common construct.

EFA and reliability analysis

The results of the exploratory factor analyses and reliability analyses are presented in the section below.

Life Role Salience Scale

Principal axis factoring was applied to the 16 items of the work and family subscales of the life role salience scale. Multiple items had factor loadings smaller than $.30$ and these were iteratively removed from the analysis. The resulting final structure had two distinct factors. Factor 1 had an eigenvalue of 3.818 and explained 23.86% of the variance. Factor 2 had an eigenvalue of 2.664 and explained 16.65% of the variance. All items had factor loadings greater than $.30$ as seen on Table 4. These factors represent the work role salience and family role salience subscales.

Table 4
Factor loadings of the work and family role salience scale dimensions

Items	Factor 1:	Factor 2	Communalities
Occupational work reward value 1	.026	.414	.172
Occupational work reward value 2	.229	.550	.355
Occupational work reward value 3	-.041	.219	.050
Occupational work reward value 4	-.135	.452	.223
Occupation role commitment 1	.045	.287	.084
Occupational role commitment 2	.282	.479	.309
Occupational role commitment 3	-.005	.649	.422
Occupational role commitment 4	.071	.720	.523
Parental role commitment 1	.800	.032	.641
Parental role commitment 2	.766	.008	.588
Parental role commitment 3	.355	.135	.144
Parental role commitment 4	.674	.068	.459
Homemaker role commitment 1	.443	.099	.206
Homemaker role commitment 2	.587	-.067	.349
Homemaker role commitment 3	.538	-.274	.364
Homemaker role commitment 4	.618	.090	.390
Eigenvalue	3.818	2.664	
% Variance explained	23.86%	16.56%	
% Cumulative variance	23.86 %	40.51%	

Notes. N = 191 after listwise deletion of missing data

Factor 1 was labelled *Family role salience* and factor 2 was labelled *Work role salience*. Both work and family role salience scales had acceptable Cronbach alphas. The family role salience scale (6 items) had a Cronbach alpha of .82. This value is indicative of a moderate internal consistency (Maree, 2013). The work role salience scale (4 items) had a Cronbach alpha of .69. This value is indicative of a low internal consistency.

Gender Role Ideology

The factor analysis of the five-item gender role ideology scale yielded one factor. This factor had an eigenvalue of 3.119 and explained 62.378% of the variance. All items had factor loadings greater than .30 (see Table 4). The new factor was labelled Gender role ideology (GRI) and, had an acceptable Cronbach alpha of .846. This value is indicative of a moderate internal consistency (Maree, 2013).

Table 5

Factor loadings of the GRI scale dimension

Items	Factor 1	Communalities
Gender Role Ideology 1	.668	.446
Gender Role Ideology 2	.670	.449
Gender Role Ideology 3	.771	.594
Gender Role Ideology 4	.778	.606
Gender Role Ideology 5	.750	.563
Eigenvalue	3.119	
% Variance explained	62.378	

N = 191 after casewise deletion of missing data. Principal axis extraction with no rotation

Parental work-family conflict

A separate factor analysis was conducted for the scales: perceived maternal work-family conflict and paternal work-family conflict. Herewith are the results of each scale's dimensionality.

Maternal work-family conflict

The use of principal axis factoring on the five-item maternal work-family conflict scale revealed 1 factor as expected. This factor explained 66.930% of the variance and had an eigenvalue of 3.346. All items had factor loadings greater than .32 and are represented in Table 5. Factor one was labelled *Maternal WTF conflict* and had an acceptable Cronbach alpha of .868.

Table 6

Factor loadings of the Maternal WTF conflict scale dimension

Items	Factor 1	Communalities
Maternal WTF Conflict 1	.779	.607
Maternal WTF Conflict 2	.823	.678
Maternal WTF Conflict 3	.811	.657
Maternal WTF Conflict 4	.810	.656
Maternal WTF Conflict 5	.600	.359
Eigenvalue	3.346	
% Variance explained	66.930%	

N = 115 after casewise deletions of missing data. Principal axis extraction with no rotation

Paternal work-family conflict

The use of principal axis factoring together with varimax rotation on the ten-item paternal work-family conflict scale revealed 1 factor as expected. This factor explained 75.477% of the variance and had an eigenvalue of 3.774. All items had factor loadings greater than .30 and are represented in Table 6. Factor one was labelled Paternal work-to-family conflict and, had acceptable Cronbach alpha of .918.

Table 7

Factor loadings of the Paternal WF conflict scale dimension

Items	Factor 1	Communalities
Paternal WTF Conflict 1	.825	.680
Paternal WTF Conflict 2	.878	.771
Paternal WTF Conflict 3	.816	.666
Paternal WTF Conflict 4	.836	.699
Paternal WTF Conflict 5	.808	.654
Eigenvalue	3.774	
% variance explained	75.477%	
% cumulative variance explained	75.477%	

N = 191 after listwise deletions of missing data. Principal access extraction with varimax rotation

Descriptive Statistics

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The descriptive statistics of the socio-demographic characteristics of this sample as well as the composite scores are contained in this section. The socio-demographic details include the future work and family expectations of students as well as their perceptions of their parents' or guardians' work and family lives while they were growing up. To ensure a clearer understanding of the data the respondents were grouped based on racial distinction. The first group of black respondents consisted of respondents from: Black, coloured and Indian respondents. The second group consisted of respondents from white respondents.

Sixty-seven percent of the respondents were raised by both parents, 17% were raised by their mother only, 2% were raised by their father only, and 6% were raised by their guardian. Sixty one percent of the respondents had mothers who were full-time employees during their childhood, 79% of the respondents had fathers who were full-time employees during their childhood, and 12% of the respondents whose guardians were full-time employees during their childhood.

With regards to their general socio-economic status whilst growing up: 95% of black respondents stated that they had less than enough, none of the white respondents had less than enough. More black respondents (56%) had just enough in comparison to white respondents (31%). Lastly, 66% of white respondents had more than enough while growing up in comparison to 27% of black respondents.

STEM students' future family and work role

The items related to the intentions of the students to work and have a family indicated that 96% of the respondents have intentions to work and 71% have intentions to have a family. Of the total sample respondents, 71% intended to get married and have children. Of that 71%: 54% expect to have their first child between the ages of 26 and 30, 16% of the respondents expect to have their first child between the ages of 31 and 35, and 3% of the respondents expect to have their first child between the ages of 36 and 40. Thirty-eight percent of respondents expect to have two children in the future ($M = 3.68$, $SD = 1.01$, $N = 191$).

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Sixty five percent females in comparison to 35% males intend to work in the future, and 60% females in comparison to 40% males intend to have a family in the future. 52% black respondents intend to work in the future whilst 39% white respondents intend to work in the future.

With regards to the parents and guardians work and family roles, the data collected indicate the following: 61% of the respondents' mothers, 79% of the respondents' fathers and 12% of the respondents' guardians worked full time during their adolescence. 67% of the respondents felt that both their mother and father were present during their childhood, 17% felt only their mother was present, 2% felt only their father was present and 6% felt only their guardian was present during their childhood. Most respondents felt their mother was both the homemaker (47%) and the parent in-charge of the child rearing (58%) during their childhood.

The descriptive statistics were computed for the composite variables. Table 9 represents the scales means (M), standard deviation (SD), standard error around the mean (SE), skewness and kurtosis. Work role salience ($M = 3.56$; $SD = .665$) was above the mid-scale point of three on a 5-point indicating attributed importance to this role across the sample. Family role salience ($M = 2.15$; $SD = .780$) was just below the midscale point of three indicating less attributed importance to this role across the sample. Gender role ideology ($M = 1.55$; $SD = .671$) was well below the mid-scale point of three. Therefore, this sample of students had egalitarian view of gender roles. Maternal WTF conflict ($M = 2.11$; $SD = .830$) and paternal WTF conflict ($M = 2.65$; $SD = 1.098$) were all below the mid-scale point of three.

Table 8
Descriptive statistics of composite variables

Variables	N	SE	Skewness	Kurtosis
Work role salience	191	.041	-.080	-.062
Family role salience	191	.052	.726	.290
Gender Role Ideology	191	.049	1.705	3.732
General self-efficacy	191	.042	-.328	.690
Maternal WTF conflict	116	.077	.376	-.629
Paternal WTF conflict	151	.089	.117	-.946

N = number of respondents; SE = standard error of mean

Correlation analyses

To gain insight into the relationships the variables have with one another, Pearson's correlation coefficient was calculated. The correlation coefficients did not have large effects. Table 10 represents the mean, standard deviation and correlation coefficient for the variables of this study. Using Cohen's recommendations (Cohen, 1992), the coefficients were interpreted by the following guidelines: values of .10 to .30 signify a small effect, values of .30 to .50 signify an average effect and values of .50 and above signify strong correlations. Correlations above .30 are noted in bold as they are deemed to signify a moderate correlation between the variables under investigation in this study (Cohen, 1992). Based on this principle Table 10 reflects the strongest relationship between Maternal WTF conflict and family role salience.

Table 9
Summary of correlations amongst study variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
Variable								
1. Work role								
salience	3.56	.665	(.714)					
2. Family								
role	2.15	.780	.180*	(.81)				
salience								
3.								
Gender								
Role	1.55	.671	-.035	.017	(.846)			
Ideology								
4. Maternal								
WTF conflict	2.11	.830	.271*	.406**	.282**	-.188*	(.868)	
5. Paternal								
WTF conflict	2.65	1.098	.061	.233**	.273**	-.292**	.580**	(.918)

Note. *N* = 191 with case wise deletion of missing data. *M* = Mean, *SD* = Standard deviation. Brackets representative of Cronbach alpha values. Significance level set at **p* < .05; ***p* < .01; ****p* < .001;

Inter-correlations with work and family role salience

Gender role ideology had a small negative correlation to work role salience ($r = -.035$, $p < .01$) indicating that, as students hold more traditional gender role ideologies then they have less work role salience. Gender role ideology had a small positive correlation to family role salience ($r = .017$, $p < .01$). This indicates that as students hold more traditional gender role ideologies then they have more family role salience. Maternal WTF conflict was positively correlated to work role salience ($r = .271$, $p < .01$) and positively correlated to family role salience ($r = .406$, $p < .01$). Paternal WTF conflict had a small positive correlation with both work role salience ($r = .061$, $p < .01$) and family role salience ($r = .233$, $p < .01$). Based on the correlation analyses maternal WTF conflict had a greater effect on family role salience than work role salience for the sample. The findings were not indicative of significant effects.

Based on the results of the correlation analyses; Proposition 1a), Proposition 1 b) and Proposition 2 a) was supported by the correlation analyses.

Regression analyses

Separate regression analyses were run to assess the extent to which student's gender and their same sex parent's work-to-family conflict were related to students' family role salience. For female students, maternal WTF conflict did not statistically significantly predict family role salience, $F_{2247} = .381$, $p < 0.1$, $R = .165$. The adjusted R^2 indicated that only 15.7% of the variability in family role salience could be explained by the model.

The regression analyses run for male students revealed that paternal work-to-family conflict did not statistically significantly predict family role salience $F_{8587} = .166$, $p < 0.1$, $R = .054$. The adjusted R^2 indicated that only 4.8% of the variability in family role salience could be explained by the model. Table 11 details the results of the regression analyses. Therefore, based on the results of the regression analyses Proposition 2 b) and c) were supported.

Table 10

Standard simple regression:

	B	β
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Family role salience

Maternal WTF conflict	.381	.406***
Paternal WTF conflict	.166	.057***
R²	.165	.054
Adjusted R²	.157	.048

Notes. *p ≤ .05, **p ≤ .01, ***p ≤ .001 WTF = work-to-family conflict; N = 124.

Final notes

The results of the exploratory factor analysis revealed two distinct factors for life role salience, these being work role salience and family role salience. The correlation results indicated that as students held greater traditional gender role ideologies, their work role salience would decrease, while their family role salience would increase. Maternal work-family conflict is positively correlated to work role salience. The results of the regression analyses provided support for the propositions that students family role salience is correlated with that of their same sex parent. Table 12 is a summary of the findings of this study based on the propositions set out in Chapter 1 and assessed in this chapter.

Table 11

Summary of Tested Propositions and Findings

Propositions Tested	Data Analytic Procedure	Support
1 a. Traditional gender role ideology is related to family role salience among STEM students	Correlation	Supported
1 b. Egalitarian gender role is related to work role salience among STEM students	Correlation	Supported
2 a. Maternal work-to-family conflict is positively related to work role salience	Correlation	Supported
2 b. Female student's family role salience is predicted by maternal workfamily conflict.	Regression	Supported

	Regression	Supported
2 c. Male student's family role salience is predicted by paternal work-family conflict		

Chapter 5: Discussion

The aim of this study was to assess the extent to which the work and family role salience of students can be predicted by the work-family conflict of their parents as well as gender role ideology. The purpose of this chapter is to discuss the results of this study regarding existing literature on student's work and family role salience. This chapter will also contain a discussion on theoretical and practical implications as well as suggestions for future research.

Contributions of this study

This study adds value to increasing knowledge in the field of students work and family role salience through the following specific contributions:

1. Empirically examining the relationship between life role salience and gender role ideology
2. Empirically examining the relationship between life role salience and parental work-family conflict

Psychometric Properties of the Study's Scales in a South African Context:

Life role salience, Gender role ideology and Parental WTF Conflict

The literature suggested two aspects of life role salience would emerge from the scale: work role salience and family role salience. Using EFA, this was shown as the life role salience items loaded onto two distinct factors, which indicates that the participants could distinguish between having a work role and a family role in the future. The reliability of both scales was above 0.7 making them acceptable for data analysis.

The gender role ideology scale loaded onto one factor as suggested by previous research. Similarly, both the maternal and paternal work-to-family conflict scales also loaded onto one distinct factor as suggested by previous research. The reliability of the scales was all acceptable being above 0.7 and were thus deemed applicable for data analysis.

Life Role Salience of STEM Young Adults

As proposed, the life role salience of students can be grouped into work role salience and family role salience. This is similar to findings by Friedman and Weisbrodd (2005) and Hartung and Rogers (2000). Young adults of this study had a greater attributed importance to their future work role ($M = 3.79$, on a 5 point scale, $SD = .57$) than their family role ($M = 2.25$, on a five-point scale, $SD = .71$). This indicates that in the future, young adults in STEM studies can expect to hold their roles as employees to a greater importance than those in their homes. This was further supported by a greater indication by the students to work than to have a family. 96% of students had intentions to work whilst only 71% of the students had intentions to start a family one day.

These findings are inconsistent with those of Hartung and Rogers (2000) as well as the findings of Friedman and Weisbrodd (2005). Both these studies reported findings of equal attributed importance to both work and family roles by young adults. Inconsistent with these studies was that of Cinamon et al., (2008) where Israeli young adults attributed a greater importance to their future family role than that of their work role. Cinamon et al., (2008) reasoned that the traditional values of the Israeli society could be reflected in these results. Traditional values that place a great importance on family obligations and commitments because the society is dominantly Jewish and Arabic.

Similarly in a country such as South Africa, traditional values would also be common in comparison to Western values and culture. South Africa consists of a variety of cultures such as Indian and Hindu individuals, and White Afrikaans individuals and a number of Black cultures. These are all traditional cultures. However the influence of globalisation and the effects of democracy provide young adults with more opportunities now than previous generations. The young adults of this study may have a greater intention to work than raise a family because of the opportunities they have available to them to have a career and progress in it.

Watson, Stead, and De Jager (1995) attributed culture for the significant difference in South African students role salience in their study. Perhaps the difference between work role salience and family role salience (of the young adults in this study) could also be a reflection of cultural differences. South Africa is a country with a variety of

cultures. Even though the analysis consisted of two groups of racial distinction, within that distinction lies a complexity of cultures which could also contribute to the decisions the young adults of this study make regarding their future work and family roles.

Gender role ideology and life role salience

As suggested in previous literature; gender role ideology has a positive correlation with family role salience and work role salience (Kaufman 2005; Loo & Thorpe 2005). This study found support only for the correlation of family role salience and not for work role salience. The gender role ideology scale revealed that this study's young adults held predominantly egalitarian gender role ideologies ($M = 1.55$; $SD = .67$). The results indicate that students' gender role ideologies are a greater influence of their family role than their work role. Meaning that the decision to start a family or share a home is influenced by the beliefs students have about the different roles women and men play in society.

Most of the students had intentions to work and they had intentions to have a family. More women than men intended to work in the future and have families in the future. This could be an indication of female students' belief that they could engage in both work and family roles. In comparison to male students who had less intentions to engage in both roles in the future. Female students may have greater intentions to work than their male counterparts because of the opportunities provided to them. Careers in STEM related fields now provide women with more opportunities than in the past and women participation is greatly encouraged.

This can be seen in the difference between men and women respondents. More men than women respondents were anticipated prior to data collection because the STEM field is one that is dominated by males. It was surprising that in this study there were more women ($N = 106$) than men ($N = 61$) who responded to the survey. This raises the need to investigate why the number of women who participate in the field decreases drastically between university and practice.

Knowing that young adults seek families and careers (career advancement); organisations should provide the right support for their future employees. Whether it is in the form of flexible working hours or adequate work and family policies, organisations can do more to support women in STEM fields. By doing this they not

only will attract top talent but also retain it and contribute to a greater participation of women in STEM fields.

Parental work-family conflict and life role salience

Proposition 2 a-c stated that the experiences of the mothers of STEM students would influence their work role salience. The propositions also stated that the work-family conflict experienced by parents would have an impact on the work role salience on children of the same sex i.e. Mothers WTF conflict would influence their daughters work role salience whilst paternal WTF conflict would influence their sons work role salience.

The results of the correlation indicate that the sample of students in this study, had indeed modelled their own perceptions of work and family roles, after their parent's experiences of work and family conflicts. Maternal WTF conflict was positively correlated with work role salience and had a significant correlation to family role salience. The regression analysis performed also confirmed that maternal and paternal work-to-family conflict were positively correlated to the work role salience of the same sex child. These results are consistent with the findings of Basuil & Casper (2012) as well as the basis of social learning theory.

This study helped provide insight to the work and family plans of students in STEM related fields. Particularly, the way gender role ideology and the experiences of their parents contribute to these plans. The limitations of this study are discussed below as well as the recommendations for future research which will help to address this study's limitations.

Limitations and recommendations for future studies

One of the limitations of this study is its research design that is cross-sectional. With a cross-sectional research design one cannot make inferences about the relationships between variables. A larger sample size would have lowered the likelihood of error in generalising to the population of STEM students, therefore the small size of the sample ($n = 191$) is a limitation of the study (Welman et al., 2005). Further studies of life role salience could include the role self-efficacy plays in the importance on the expectations of students' future work and family role salience.

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The number of women in STEM related fields decreases between the time that women are in their university years of studying and the time they work. Studies relating to examining the attrition of women in STEM related careers will provide insight into the factor that diminish the intention to work and have a family, by female students. Eighty-four percent of students in this study were female, and they indicated that they had intentions to work and have a family. A longitudinal study will also provide insight into if these intentions change over time.

Further research could be conducted that examines the self-efficacy of students into managing their future work and family roles. Self-efficacy is defined as “one’s belief in their ability to accomplish a specific task” (Bandura, 1977). Self-efficacy is a component of social cognitive career theory. Based on this theory, an individual’s self-efficacy is influenced by personal performance accomplishments, vicarious learning, social persuasion and, psychological and affective states (Bandura 1977). In studies related to life role salience research amongst students, context specific self-efficacy (as opposed to general self-efficacy) has been used and correlations reported between it and work and family role salience (Basuil & Casper, 2012; Brown & Lavish, 2006; Chung, 2002). Students with high work-family balance self-efficacy were found to be more knowledgeable and having greater commitment to their future work and family roles. Self-efficacy as a variable in a life role salience study will be valuable as those with a high self-efficacy will be seen as being able to manage multiple roles (Cinamon, 2010).

This study examined work-family conflict which is the negative aspect of the interaction of both work and family roles. However, there is also a positive aspect to the interaction of these two roles which is known as work-family enrichment. Work-family enrichment refers to “the extent to which an experience in one role improves the quality of life namely, performance or affect, in another role” (Greenhaus & Powell, 2006). The benefits associated with work-family enrichment include improved: job satisfaction, affective commitment and family satisfaction (McNall, Nicklin, & Masuda, 2010). Workfamily enrichment studies examining the positive experience managing multiple roles would bring students could be a source of great information for a limited body of research.

Implications of the present study

Research conducted by this study will provide information which could be valuable to career counsellors. The study provides information on the identity of students as it relates to their career development at this stage of their lives. The study also provides information about the plans that young adults have or might not have regarding their future work and family plans. Career counsellors would find this information helpful when developing interventions to help individuals cope with the demanding expectations of both these roles. The interventions designed would then ease any work-family conflict that might occur, or they can improve work-family enrichment.

This study has provided employers with information about their future employees. That being students studying in STEM fields value both their work and family roles. That attracting them into their employ should include a plan for fulfilling both these roles. A good work-family policy by the organisation would make them attractive to millennials seeking work opportunities.

Conclusion

Knowing the perceptions young adults hold about their future work and family roles is valuable to career development counsellors and future employers. Recent research by Deloitte (2016) shows that young adults seek a work-life balance in their future careers. Young adults also consider their work-life balance an important aspect of their identity and an integral measure of career success (Boston College Centre for Work & Family, 2015). STEM fields are fields that are an important measure of economic success for a country. These fields also have little representation of women in comparison to men.

This study provided information into the future work and family plans of STEM students. Most students planned on working and having a family. More women than men planned on working and having a family. Organisations should develop work-family policies that allow their employees to fully participate in both their work and family roles. By doing this they will gain a competitive advantage in the effort to attract talent to their organisation.

This study also provided insight into how, gender role ideology and parental work and family conflict influence the way in which students in STEM field, place value in their

future work and family roles. The factor analysis revealed that students could distinguish between work and family roles which is conducive with previous findings by (Friedman & Weisbrodd, 2005). The findings indicate that the sample of students used attribute importance to both work and family roles, with a slightly greater importance attributed to the family role. The importance of these roles to STEM students was also influenced by their parents' experiences. The results of the simple regressions indicate that the students modelled their life role salience after that of their same-sex parent.

This study provided useful insight into the future work and family plans of not only South African students, but of those in STEM sciences. Future studies could look at the cultural differences between students and their impact on their work and family plans. Future studies could also look at STEM students' belief in their belief to manage these future roles and the factors that influence these beliefs.

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Appendices

Appendix A: Survey Cover Page



Dear student

Thank you for participating in this research. This survey forms part of a larger study of the anticipated work-family interface of STEM students in South Africa. It will contribute to the completion of my Masters dissertation at the University of Cape Town.

I am interested in finding out more about student's perceptions of their future work and family roles and their perceived self-efficacy in managing these future roles. I am also interested in finding out how gender role ideology and parental experience of the workfamily interface influences students self-efficacy of their anticipated work-family interface. The survey is anonymous and confidential; it should take no longer than 20 minutes to complete. There are no right or wrong answers, I am interested in your perception of the work-family interface.

If you have any queries or concerns, please do not hesitate in contacting: me (nzmnto004@myuct.ac.za) or my supervisors Prof Jeffrey Bagraim (Jeffrey.Bagraim@uct.ac.za) and Dr Ameeta Jaga (**Ameeta.Jaga@uct.ac.za**)

This research has been approved by the Commerce Faculty Ethics in Research Committee at the University of Cape Town, as well as the Executive Director of Student Affairs of the University of Cape Town. Your participation in this research is on a voluntary basis and you can at any point withdraw your participation. You are not required to provide your name or contact details and nobody will be able to identify who you are. The survey is confidential and all data generated will be strictly used for academic research purposes.

Kind regards

Lungelo Nzima

Appendix B: Survey Measures

Life Role Salience

Please indicate the extent to which you agree with the following statements by indicating the extent to which you strongly agree or strongly disagree.

About your future work

Having work that is interesting and exciting to me is my most important life goal

I expect my job to give me more real satisfaction than anything else I do

Building a name and reputation for myself through work is not one of my life goals

It is important to me that I have a job in which I can achieve something of importance.

About your future career

I want to work, but I do not want to have a demanding career.

I expect to make as many sacrifices as are necessary in order to advance in my work.

I value being involved in a career and expect to devote the time and effort needed to develop it.

I expect to devote whatever time and energy it takes to move up in my career field.

About your future parenting role

I expect to devote a significant amount of my time and energy to the rearing of children of my own.

I expect to be very involved in the day-to-day matters of rearing children of my own.

Becoming involved in the day-to-day details of rearing children involves costs in other areas of my life which I am unwilling to make

I do not expect to be very involved in child-rearing.

About your future homemaker role

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I expect to leave most of the day-to-day details of running a home to someone else I expect to be very much involved in caring for a home and making it attractive.

I expect to assume the responsibility for seeing that my home is well kept and well run.

Devoting a significant amount of my time to managing and caring for a home is not something I expect to do

About your views on the roles of men and women in society

Please indicate the extent to which you agree with the following statements by indicating the extent to which you strongly agree or strongly disagree.

- (a) A woman's place is in the home, not the office or shop.
- (b) A wife with a family has no time for outside employment.
- (c) Employment of wives leads to more juvenile delinquency.
- (d) It is much better if the man is the achiever outside the home and the woman takes care of the home and family.
- (e) Women are much happier if they stay home and take care of children.

About my parents' employment status during my childhood.

Parental employment status during childhood

- a) Did your mother work full time? (yes/no)
- b) Did your father work full time? (yes/no)

About your mother's work and family conflict

Please indicate the extent to which you agree with the following statements by indicating the extent to which you strongly agree or strongly disagree.

The demands of my mother's work interfered with her home and family life

The amount of time my mother's job took up made it difficult for her to fulfil family responsibilities

The things my mother wanted to do at home did not get done because of the demands her job put on her

My mother's job produced strain that made it difficult for her to fulfil family duties

Due to work-related duties, my mother had to make changes to her plans for family activities

About your father's work and family conflict

Please indicate the extent to which you agree with the following statements by indicating the extent to which you strongly agree or strongly disagree.

he demands of my father's work interfered with his home and family life

The amount of time my father's job took up made it difficult for him to fulfil family responsibilities

The things my father wanted to do at home did not get done because of the demands his job put on him

My father's job produced strain that made it difficult for him to fulfil family duties

Due to work-related duties, my father had to make changes to his plans for family activities

Demographic items

1. Age
 - a. Number of years
2. Gender
 - a. Male
 - b. Female
 - c. Prefer not to answer
3. Race
 - a. Black
 - b. White
 - c. Indian
 - d. Coloured
 - e. Prefer not to answer
4. Registered Degree
 - a. Engineering and Construction related
 - b. Maths and Statistics related
 - c. Science related
 - d. Computer and Technology related

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5. Parent/guardian educational status: Please tick the applicable option answer under each applicable statement.
- a. My mother has a:
 - i. Matric certificate
 - ii. University degree
 - iii. Diploma
 - iv. Postgraduate qualification
 - v. Did not complete Matric
 - b. My father has a:
 - i. Matric certificate
 - ii. University degree
 - iii. Diploma
 - iv. Postgraduate qualification
 - v. Did not complete Matric